

REMARKS

This is in response to the non-final Office Action dated June 9, 2009 (the Action).

I. Status of the Claims

Claims 1-2, 4-6, 8-13, 15, 18-22, 24-25 and 37 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,844,996 to Enzmann et al. ("Enzmann"). Claim 26 stands rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,436,057 to Goldsmith et al. ("Goldsmith"). Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Enzmann in view of U.S. Patent No. 6,665,410 to Parkins ("Parkins"). Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Enzmann in view of U.S. Patent No. 5,444,786 to Raviv ("Raviv"). Claims 16, 17 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Enzmann in view of Goldsmith. Claims 14 and 27-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Enzmann in view of U.S. Patent No. 4,677,676 to Eriksson ("Eriksson"). Claim 38 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Enzmann in view of "official notice."

In response, independent Claims 1 and 18 have been amended as indicated above. Various dependent claims have been canceled or amended for consistency and Claims 40-54 are newly added to provide a more complete claims set. Independent Claims 24-27 and 31 have been amended to depend from Claims 1 and 18. Support for the above amendments can be found, for example, in Claims 8-13 and in the application in paragraphs [0031], [0041], [0044], [0052] – [0067].

Reconsideration is respectfully requested in view of the above amendments and the remarks that follow.

II. Independent Claims 1 and 18

Independent Claims 1 and 18 stand rejected as being anticipated by Enzmann. Enzmann seeks to sense noise in a first sound region in order to provide an "anti-noise" signal to a second sound region to cancel the sound in the second sound region. *See* Abstract. A

microphone is situated in the second sound region to detect any noise above a predetermined noise level in the second sound region to provide an error correction signal. The "anti-noise" signal is modified responsive to the error correction signal to bring the noise in the second sound region to a level that is below a predetermined noise level. *See Abstract.* Stated otherwise, Enzmann relies on error microphones that are located in the cancellation location to repeatedly tune and remodel the error correction signal.

In contrast, Claims 1 and 18 as amended generally recite a situational transfer function of individual transfer functions such that each individual transfer function corresponds to a sound source location (such as a snorer's location) and a cancellation space location (such as a bed partner's ear location). As discussed in the specification, this situational transfer function, formed of individual transfer functions, may be formed during a training session as recited in certain dependent claims. A current individual transfer function is identified corresponding to the combination of the the current location of the sound source and the current location of the cancellation space. The cancellation sound is broadcast based on the sound input and the current individual transfer function for reducing sound proximate the cancellation location. In summary, Claims 1 and 18 recites as follows (emphasis added):

1. A system for sound cancellation comprising:
 - a source microphone for detecting sound propagating from a mobile sound source remote from the source microphone;
 - a source localizing sensor for determining a current location of the sound source;
 - at least two speakers configured to direct a canceling sound toward a mobile cancellation location that is spatially remote from the sound source and the speakers,
 - a cancellation space localizing sensor for determining a current location of the mobile cancellation space; and
 - a computational module in communication with the source microphone, the source localizing sensor, the speakers, and the cancellation space localizing sensor, the computational module including a memory storing a situational transfer function of individual transfer functions, each individual transfer function corresponding to at least a sound source location and a cancellation space location, the computational module configured to receive a signal from the microphone, to identify at least one current individual transfer function corresponding to the current location of the sound source and the current location of the cancellation

location, and to control the speakers to transmit a cancellation sound signal based on the at least one current individual transfer function to the speakers.

18. (Currently Amended) A method of sound cancellation comprising:
- detecting a sound input at an input location that is spatially remote from a sound source, the sound input including undesirable sound propagating from a mobile sound source remote from the input location;
 - determining a current location of the mobile sound source;
 - determining a current location of a mobile cancellation space;
 - providing a plurality of locations-dependent situational transfer functions, each transfer function corresponding to at least a sound source location and a cancellation space location;
 - identifying a current situational transfer function corresponding to the current location of the sound source and the current location of the cancellation space; and
 - broadcasting a cancellation sound based on the sound input and the current individual transfer function of the situational transfer function for reducing sound proximate the cancellation location.

Briefly, determining the current locations of the mobile sound source and the mobile cancellation space permits the selection of a particular transfer function suitable for that particular combination of locations (e.g., two heads). In some embodiments, the need for microphones immediately proximate the source or target locations to account for sleep movements as shown in the prior art is reduced or eliminated because the computational module according to embodiments of the present invention senses those locations, and selects a function for cancellation that accounts for the acoustical environment created by the participating acoustical elements (e.g., heads, pillows, headboards, microphones, speakers, etc., and potentially cross-talk). Enzmann does not, at least, create the individual transfer functions, nor a collection of them (the situational transfer function), nor use current locations of the source and cancellation space locations to identify the individual transfer function to use to form the cancellation sound.

Accordingly, Applicants submit that nothing in Enzmann discloses the above emphasized recitations of Claims 1 and 18. These recitations are also not disclosed in Goldsmith, Parkins, Raviv, or Eriksson.

For at least the response discussed above, Applicants request that the rejections of Claims 1 and 18 and Claims 2-5, 14-17 and 19-38 be withdrawn.

New Claims 39-43 also depend from independent Claims 1 and 18, and Applicants submit that such claims are patentable at least per the patentability of the Claims from which they depend.

III. Dependent Claims 38 and 40

Claim 38 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Enzmann in view of "official notice." New Claim 40 generally recites the subject matter of Claim 38.

The Action concedes that Raviv and Enzmann do not disclose the situational transfer matrix function recited in Claim 38. However, the Action states as follows:

Official notice is taken that both the concepts and advantages of using various transfer matrix functions to perform adaptive filtering are well known in the art. Thus it would have been obvious to use the transfer matrix function W , $W = 1/(d-c*e)$ so the system could self-adjust itself according to optimizing algorithms.

See the Action, page 3.

The MPEP § 2144.03 states that official notice should only be taken where the facts asserted are well-known or common knowledge in the art, *i.e.*, "capable of such instant and unquestionable demonstration as to defy dispute" (citing *In re Knapp Monarch Co.*, 296 F.2d 230, 132 USPQ 6 (CCPA 1961)).

It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art.

MPEP § 2144.03 (emphasis in original) (citations omitted).

Applicants submit that the alleged disclosure of one transfer function does not render all transfer functions to be obvious (including the specific transfer function recited in Claims 38 and 40) based on "official notice." The Action has provided no basis for why the specific transfer function recited in Claims 38 and 40 would be well-known, and therefore, the standard articulated in MPEP § 2144.03 has not been met. The situational transfer matrix function recited in Claims 38 and 40 is reproduced below.

A situational transfer matrix function, **W**,

$$\mathbf{W} = 1/(\mathbf{d}-\mathbf{c}*\mathbf{e})$$

wherein **c** is a transfer function for sound propagation from the sound source to the source microphone, **e** is a transfer function for sound propagation from the speaker to the cancellation location, and **d** is a transfer function for sound propagation from the source microphone to the speaker, and the * operator denotes mathematical convolution.

Accordingly, Applicants submit that Claims 38 and 40 are separately patentable and request an indication of same. However, if the rejection is maintained, Applicants request that additional evidence be provided in any subsequent Official Action pursuant to MPEP § 2144.03.

Conclusion

Applicants respectfully submit that this application is now in condition for allowance, which action is requested. Should the Examiner have any matters outstanding of resolution, he is encouraged to telephone the undersigned at 919-854-1400 for expeditious handling.

Respectfully submitted,



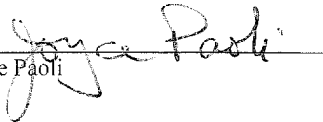
Laura M. Kelley
Registration No. 48,441
Attorney for Applicants

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Post Office Box 37428
Raleigh, North Carolina 27627
Telephone: (919) 854-1400
Facsimile: (919) 854-1401

CERTIFICATION OF ELECTRONIC TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) to the U.S. Patent and Trademark Office on November 9, 2009.



Joyce Paoli